

Morning Forecast Discussion: May 6, 2011

Submitted by kbowley on Fri, 05/06/2011 - 12:15

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Weather conditions continue to remain dry through central Oklahoma for the next several days despite another likely frontal passage Saturday. Today will be another day of relatively clear skies with 10-20 knot surface winds, and some scattered cumulus clouds later this afternoon before sunset. Overnight, a weakly-forced low-level cyclone is expected to form in western Oklahoma, which coupled with a relatively strong low-level jet should lead to precipitation formation over central and eastern Kansas. However, this precipitation is not expected to have any impact on the SGP site, though it may bring a bit of precipitation to the NE sounding site. The trailing 'cold' front associated with the system is likely to propagate through the region between 15 and 18 UTC, though there is some suggestion that the front will wash out before reaching our area; regardless, it is expected to be a dry frontal passage. A relatively strong dry line is expected to form through the day Sunday which will be coupled with a strong upswing in our daytime temperatures. Strong elevated instability will be in place, with CAPE values exceeding 3000 J/Kg; however, we will be heavily capped with CIN values of 400-600. Though precipitation is not out of the question, the atmosphere will need quite a kick to initiate convective cells Sunday, though if convection does occur, the resulting cold pools and gust fronts may be enough for further convection. That said, convective initiation remains very unlikely Sunday. As we push further into the week, a digging trough over the western US will provide better upper-level forcing through both the 250 hPa jet and 500 hPa absolute vorticity advection, with an enhanced likelihood of convective storms Tuesday and Wednesday over central Oklahoma in particular, with isolated convection still possible though less likely Sunday and Monday.

Forecasts

Time of Day:

Morning

Day 0:

05/05/2011

Forecast for Day 0:

Relatively weak flow aloft is leading to docile surface conditions throughout the southern plains today, though surface winds are anticipated to increase through the day before diminishing in the evening hours. Some low-level fair weather cumulus are possible this afternoon, although the conditions for these cloud formations are not as prevalent as they were in the afternoon hours on the 5th. Tonight, the nose of a 250 hPa jet is anticipated to work its way into western Kansas in the overnight hours as a low-level cyclone develops over western Oklahoma. Though upper-air forcing is quite weak, a relatively strong and somewhat moist low-level jet should provide a source of moist ascent north of the associated warm front, though model guidance agrees on this region of moist ascent being centered over central and eastern Kansas, as supported by the 00 UTC GFS 700 hPa vertical velocity, showing a bullseye of upward motion in this region. All this said, it is exceptionally unlikely that precipitation will occur over SGP in association with this ascent.

Day 1:

05/06/2011

Forecast for Day 1:

As the cyclone which formed overnight proceeds to the northeast, the associated 'cold' front will pass through with dry frontal passage, likely in the 15-18 UTC range assuming it doesn't wash out before reaching SGP. Other than a weak wind-shift, expected winds in the region will be calmer than Friday, while temperatures will continue to increase to several degrees above Friday's high. In addition, a dry line will begin to form through western Oklahoma and

western Texas through the day.

Day 2:

05/07/2011

Forecast for Day 2:

With the moisture gradient across our dry line building overnight Saturday into Sunday, and some moisture return to the southern plains, Sunday looks to be the first day of many with better chances for convection than we have seen in over a week at SGP. Plenty of low-level warming will occur as our upper-level trough continues to dig down the west coast. CAPE values exceeding 3000 J/kg are anticipated over central and eastern Oklahoma Sunday with very steep lapse rates in the mid to upper troposphere. However, strong daytime heating will result in a very dry and capped lower troposphere, with surface dewpoint depressions of up to 30 F possible, and CIN values of 300-600 J/kg. Despite these potential limiting factors, there is still a slight chance (5-10%) that a bulge in the dry line will provide enough lift to push through the cap and result in convection. If this is the case, the resulting cold pools and gust fronts could potentially be strong enough to fire further convection, though this again is all dependent on the dry line providing hard enough a kick to push through a quite stable lower atmosphere. If storms do occur, they would likely initiate in the 20-22 UTC time frame.

Extended Outlook:

The early part of the week continues to yield the potential for storms as our upper-level low digs into the mountain west before pushing through our region mid-week. As the energy from the upper-levels begins to get ejected over the southern plains, regions of organized severe convection appear likely. However, the exact timing still remains to be known, and our best timing won't likely be known until the system reaches the sounding network out west. Regardless, it looks quite possible that 2+ days of operations in weather are likely through the middle of the week before the system clears off to our east.